Quaternary Mapping
Moran Heights, Labrador
and Gander-Gambo area, Newfoundland

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ABSTRACT

Quaternary mapping at Moran Heights has defined a regional ice flow to 050 followed by a later recessional ice flow to the north. A program of till sampling is recommended as follow-up to define a source area for uranium bearing boulders.

Regional Quaternary mapping in the Gander-Gambo area was continued and further results are expected to be released in 1985. In addition a need for consultation between the Quaternary Geologist and Soil Scientist is highlighted.

A. Moran Heights, Labrador, 13K/10

In 1984, Saarberg Interplan carried out a uranium exploration project on ground formerly held under joint venture by CANICO and BRINEX (Perry, 1980). The area (Figure 1) contains a concentration of uranium-bearing boulders situated between a ridge of basalt and a small lake. The former property holders had concluded that the boulders were in colluvium derived from the hillside above. Drilling in this area had failed to intersect any significant amounts of mineralization. The author visited the site at the request of Saarberg to help resolve the question of glacial transport.

Quaternary mapping using landform classification on 1:50,000 and 1:15,840 airphotos plus ground truthing during three days of field work established two ice flow events. The first was a regional glacial flow (1 on Figure 2) towards 050 which was followed by a later advance (2 on Figure 2) consisting of a small lobe of ice that occupied the valley area at Moran Heights. Flow during this later recessional event was to the north, as shown by striae, grooves, and streamlining and stossing (roche moutonnée) of outcrop areas at the north end of the pond.

The southward retreating ice lobe stalled and built a substantial recessional moraine (Figure 2) at the north end of the pond. In addition, remnants of lateral moraines can be discerned on each side of the valley. Preliminary till and pebble studies in the vicinity of the main boulder concentration indicate that the drift materials are till, containing a mixture of clasts derived from Archean granites and gneisses, Aphebian basalts, and Helikian sandstones and siltstones. The basalts are most probably from the Moran Group (forming the hillsides) and

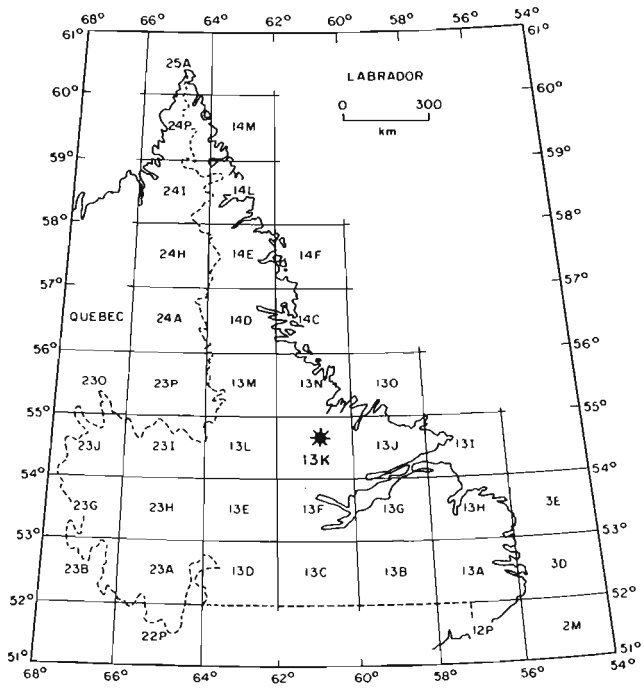

Figure 1: *Index Map, Moran Heights, 13K/10.*

the sandstones and siltstones from the Haggart Formation that lies buried beneath the drift in the valley.

In conclusion based upon land form observations and pebble lithology data, the uranium-bearing boulders do not occur within colluvium as previously assumed but are within a till derived from the south or southwest of the main boulder concentration. The distance of transport from the

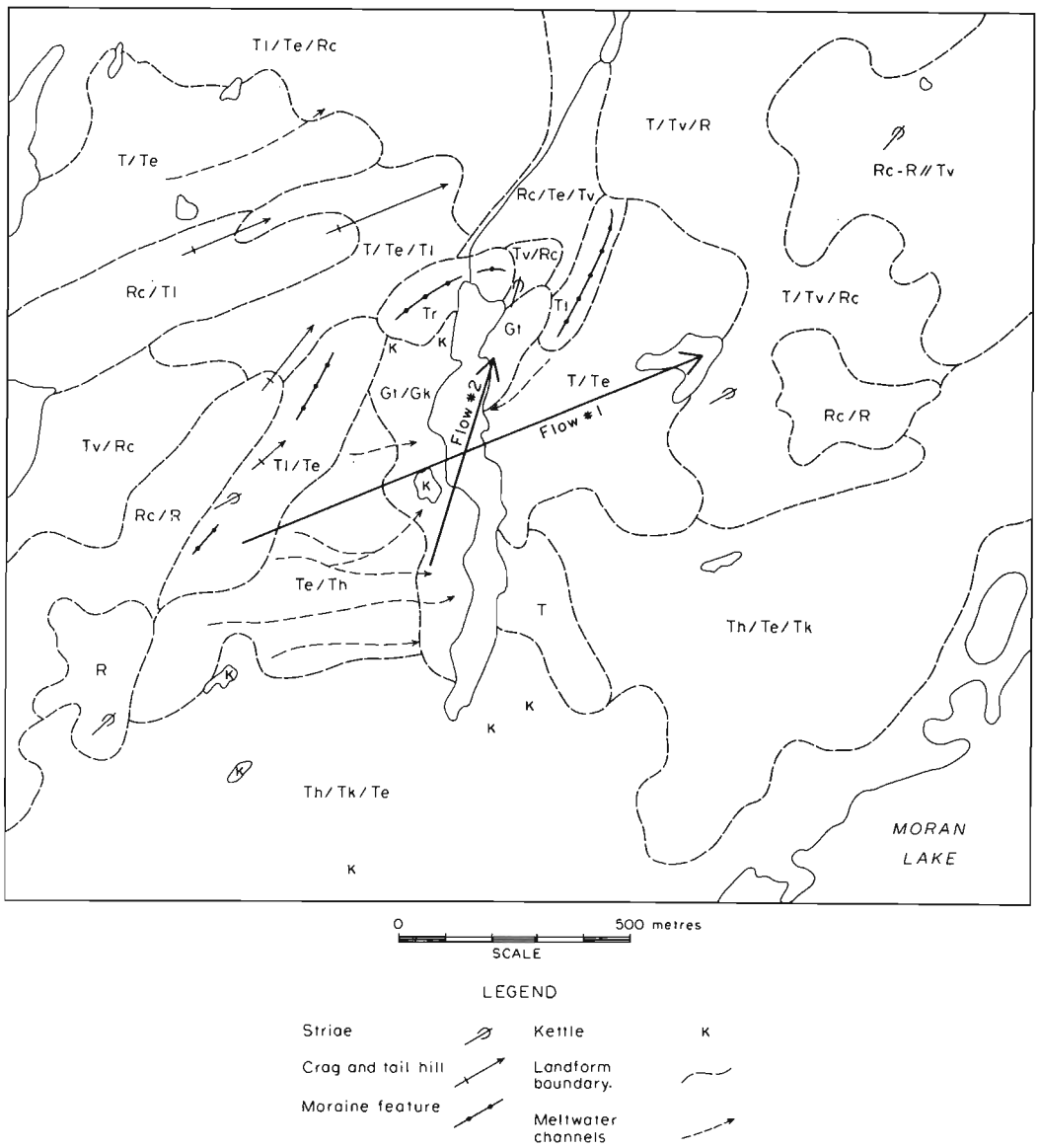

Figure 2: *Moran Heights Quaternary Mapping, 1984*
Landform Classification: T - till undifferenciated; Te - till thicker than 3 m, dissected by gullies; Tv - thin till less than 3 m deep; Th - thick till in hummocks or mounds, thickness greater than 3 m; Tl - lineated till, thickness greater than 3 m; Tk - till with kettle holes, due to deposition of till with ice blocks; Tr - till ridge deposited transverse to direction of glacial transport, greater than 3 m thick. R - barren rock or rock with minor scattered vegetation or organic cover; Rc - rock concealed by vegetation or thin organic or drift cover less than 0.5 m deep. G - glaciofluvial outwash; Gt - glaciofluvial terrace; Gk - glaciofluvial outwash deposited with ice blocks, water filled kettle holes present.

Examples: Tr - 100% of landform is a till ridge.
T/Te - 60 to 85% of landforms undifferentiated till, 15% to 40% of landforms consist of till dissected by gullies.
Th/Te/Tk - 55 to 80% of landforms in hummocks/15 to 40% till dissected by gullies/5 to 15% of landforms till with kettle holes.

source area could not be determined during this preliminary reconnaissance. Definition of a target area might best be established using a detailed till sampling program (50 m spacing along grid lines 100 m apart) over the boulder area plus a region extending up to 1 km southwest of the boulder field. In addition, pebble lithologic analyses on a 100x100 m grid pattern would be useful combined with till geochemistry in order to distinguish between uranium enrichment in tills derived from either the basalts of the Moran Group or the sandstones of the Haggart Formation. Follow-up after the till sampling program should include profile till sampling to the southwest of geochemically anomalous till areas to further define a drill target.

B. Gander - Gambo, Newfoundland, 2D/16, West Half

During 1983, Quaternary mapping and regional till sampling were conducted on the Weir's Pond map area (2E/1) and on parts of the Gambo map area (2D/16) north of the Trans-Canada Highway (Butler et al., 1984).

In 1984, this work was extended to cover the west half of 2D/16 (Figure 3), particularly the area south of the Trans-Canada Highway and around Soulis Pond. This work was aimed at ground truthing the airphoto interpretation (landform classification) and to obtain

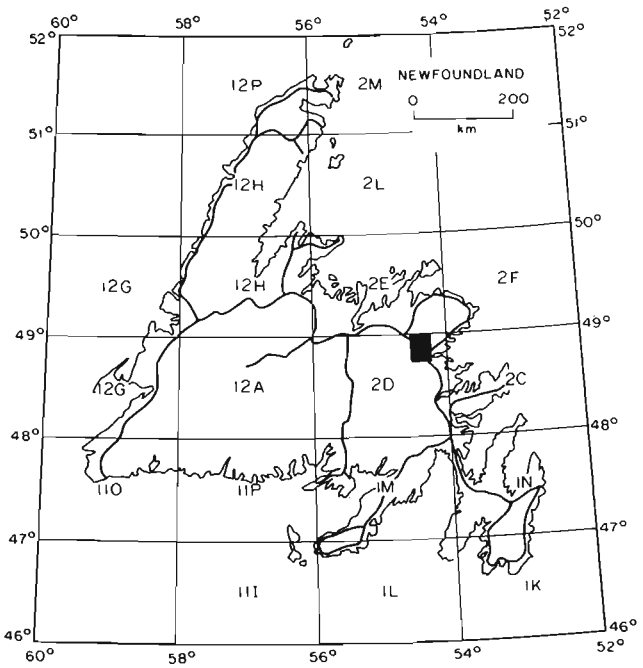

Figure 3: *Index Map, Quaternary Mapping, 1984, Gambo, 2D/16, west half.*

additional till samples for grain size, pebble lithologic and geochemical analyses.

Preliminary observations from the 1984 work confirm that two ice flows affected the area. The earlier flow was easterly while the later flow was in part topographically controlled, with radial ice flow and drawdown towards Gander Bay and Freshwater Bay, respectively. Drift south of Gander Lake is considerably thicker than in other parts of the area. In addition, an extensive ice contact, outwash system between Gander Lake and Dark Cove indicates that proglacial drainage through Gander Lake area during retreat was through the east end of the lake rather than the current drainage via Gander River to Gander Bay. Geochemistry and other data are expected to be released in 1985.

C. Liaison: Soil Scientists - Quaternary Geologists

Quaternary geologists, geochemists and exploration geologists often use soils as a sample medium or attempt to penetrate through the upper area of pedogenic (soil) development.

The need for a close working relationship between the geochemist and the Quaternary geologist has been identified by others (Coker, 1983).

There is also a growing need for Quaternary geologists and soil scientists to come together to distinguish between what is primary or depositional in character and what is the result of soil-forming processes when interpreting data from this sample medium. Some examples requiring attention or clarification are as follows: (a) distinguishing fragipans, a hard platy soil formation 15 to 30 cm deep, from fissility associated with lodgement till; (b) decreases in water mobility caused by the formation of impervious placic horizons (thicker than 3 cm called ortftein); and (c) deducing the effects of these soil-forming processes on the geochemical response in soils over mineralized terrain. Answers to some of these problems are developing and will be reported as joint consultations continue between the geologists of the Quaternary Geology Section and soil scientists from Agriculture Canada and the Newfoundland Department of Rural, Agriculture and Northern Development.

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